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Don't Mess with the NEST

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Don't Mess with the NEST

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Outline of Presentation

- NEST stands for Nuclear Emergency Support Team
- What led to its formation?
- NEST mission statement
- Nuclear Threat Credibility Assessment Program (NAP)
- Early exercises and deployments
- NEST reorganization and name change
- JTOT the Joint Technical Operations Team
- JTOT Research and Development
- Nuclear Forensics
- JTOT Exercises and Readiness

Acronyms

- ARG – Accident Response Group
- DOE – Department of Energy
- DOS – Department of State
- EG&G – Edgerton, Germeshausen & Grier, INC
- INEL – Idaho National Engineering Laboratory
- LANL – Los Alamos National Laboratory
- LLNL – Lawrence Livermore National Laboratory
- NARAC – National Atmospheric Release Advisory Capability
- NNSA – National Nuclear Security Administration
- NTS – Nevada Test Site
- OCONUS – Outside Continental United States
- RAP – Radiological Assistance Program
- SNL- Sandia National Laboratory

First Nuclear Extortion Threat October 27, 1970

Residence of Orlando: Our organization which I do not wish to name has in the city of Orlando a nuclear fission device more commonly called a hydrogen bomb that will be used to destroy the city unless certain conditions are met. The bomb is equal in power to 50,000 pounds of TNT and has a cobalt casing that will create vast amounts of radioactive fallout. The conditions are as follows: One million dollars cash in small bills and safe passage out of the country. We will give you 24 hours from the time you receive this letter to make up your minds. Give us your answer on the 6:00 o'clock news on Channel 6. If you decide to, you will hear from us later, but if you decide no Orlando will go up in a big cloud of smoke. This is no bluff. If you think it is, ask the Atomic Energy Commission what happened to the shipment of U-235 that never got to their destinations. We can be out of Orlando, Florida, before it goes off, but all the people of Orlando can't." No signature

Orlando's Nuclear Extortion Threat

- Announcement is made on 6:00 news on Channel 6
 - Letter received contact Lt. Wayne Henderson Orlando PD
 - Police wait tensely but no call is received
- Orlando checks with the AEC about missing U^{235}
 - AEC's reaction is to brag about their great security
 - That week an article in Argosy magazine discusses nuclear material missing from reactors and weapons stockpiles
 - AEC then admits there is missing material
- A handwritten letter arrives at the Police Station
 - The letter includes a drawing of the purported device
 - An "expert" finds the drawing roughly accurate
- City Officials are extremely upset and worried
 - Are they dealing with a terrorist capable of blowing up Orlando?
 - If they go public it will cause panic with injuries , looting, etc
 - They proceed to start assembling the \$1 million in cash

Orlando's Nuclear Extortion Threat (Continued)

- The handwritten letter also included an address at 1603 Mosher Drive where officials could obtain instructions on delivering the money
- The house was vacant but neighbors tell Police of a boy who mows the land and had reported finding a bomb which proved to be a dud
- The Police visit the boy and check his handwriting
 - It matches perfectly the handwriting on the 2nd letter
 - On November 5, 1970, the 14 year old boy is arrested

How to Deal with a Nuclear Extortion Threat?

- There were single Nuclear Extortion Treats in 1971, 1972 and 1973 – All were hoaxes
- In April 1974, Fred Jessen at LLNL decided a response capability was need to deal with a possible terrorist nuclear device.
- He established the “Warmspot” Program at LLNL
- A search van was built at LLNL and equipped with various hand carry radiation detection equipment

Early Search Van with Equipment



A Formal National Response Needed

- In May 1974, a Nuclear Extortion Threat is received in Boston, Mass
 - The FBI requests technical assistance
 - LLNL, LANL, EG&G/NV deployed experts under the direction of the AEC/HQ Official
 - It became clear a formal federal organization was needed to respond to Nuclear Extortions Threats
- In November 1975, Warmspot was incorporated into the multi-agency Nuclear Emergency Search Team (NEST)

NEST Mission Statement

- **The NEST Mission Statement as first established**
 - Conduct, direct, coordinate search and recovery operations for nuclear material, weapons or devices
 - Assist in identification and deactivation of Improvised Nuclear Devices (INDs) and Radiological Dispersal Devices (RDDs)
- **Then in 1980 a very sophisticated improvised explosive device was found at Harvey's Casino at Lake Tahoe, Nevada**
 - The FBI and Bomb Squads were unprepared and it detonated
 - As a result the additional phrase "and Sophisticated Improvised Explosive Devices (SIEDs)" was added to the Mission Statement

The Harvey's Casino Bomb



Results of Attempted Disablement



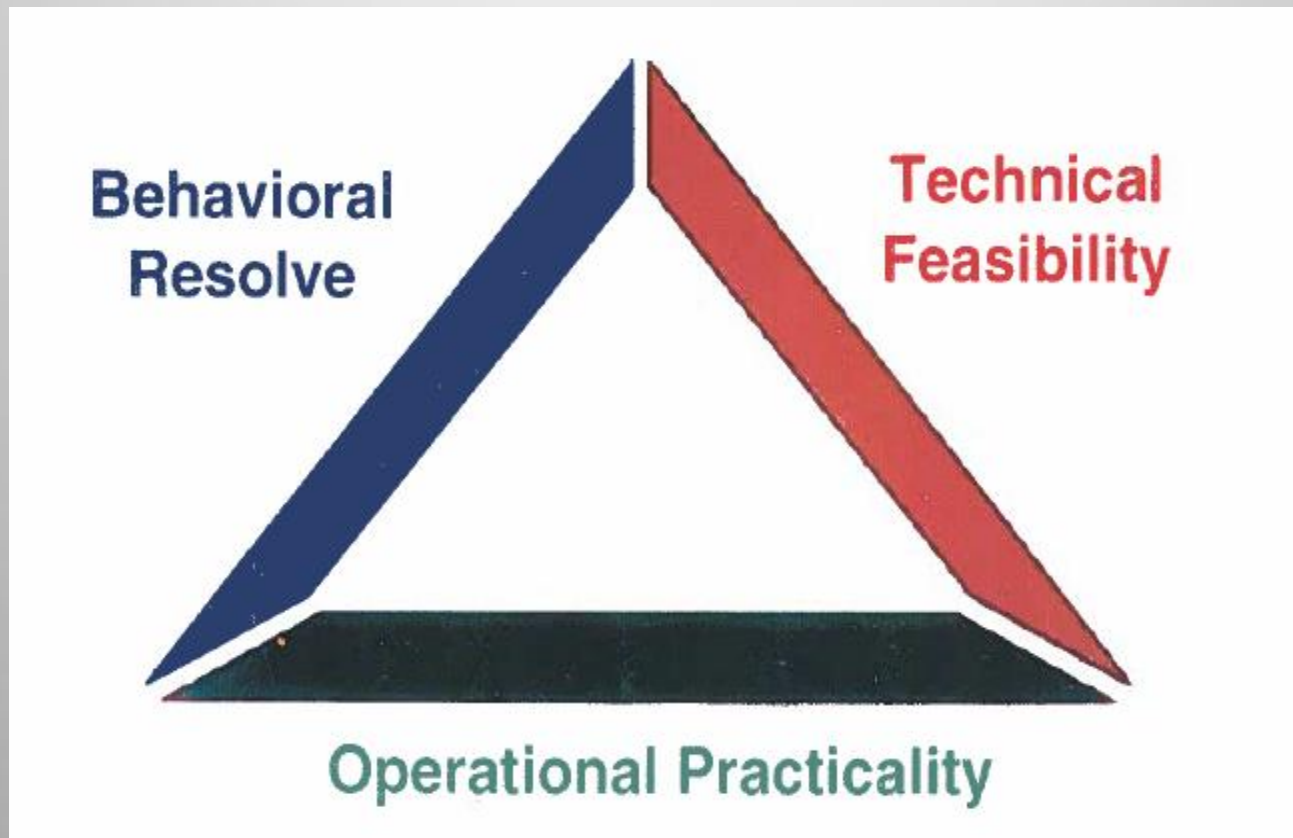
NEST Organization

- **Nuclear Emergency Search Team**
 - The AEC assigns the Nevada Operations Office (NVO) to oversee the DOE portion of the mission
 - The FBI is the Lead Federal Agency based on the Atomic Energy Act of 1954
 - LLNL, LANL, SNL and EG&G/NV form teams of volunteers to do Access, Search, Diagnostics, Device Assessment, Disablement and Containment.
 - Necessary equipment is identified, built, stored and teams are trained and put on 24/7 on-call to respond

Nuclear Threat Credibility Assessment Program (NAP)

- Since 1970 there have been over 350 Nuclear Extortion Threats threatening to use an IND or RDD
- If NEST fully mobilized for every Nuclear Extortion Threat it would waste time and resources since virtually all are hoaxes
- In 1978, Fred Jessen at LLNL, formed the Nuclear Threat Credibility Assessment Program (NAP) to determine the probability of a Nuclear Extortion Threat being real and if resources should be deployed
- Threat Messages were assessed from independent viewpoints and teams from various labs were used for crosschecking each viewpoint
 - The Credibility Coordinating Center (CCC) was at LLNL

Three Independent Viewpoints



Early NEST Exercises and Deployment

- **Union Oil in Southern California 1975 nuclear device threat**
 - NEST deployed and performed an extensive search
 - Nothing found but useful in establishing deployment procedures
- **First Major NEST Exercise, NEST 77 at INEL**
 - LLNL designed and built a sophisticated IND training device
 - FBI, DOD, LLNL, LANL, SNL and EG&G participated along with NARAC to predict a fall out pattern if notional detonation occurred
 - Diagnostics, Device Assessment and Disablement were successful

Operation Morning Light

- In 1978 the malfunctioning Russian satellite Cosmos 954 with a U^{235} fueled reactor, reentered the atmosphere over northern Canada
- The Canadian Government requested help from the US in locating and cleaning up the U^{235}
- NEST deployed bringing extensive search equipment
- The majority of the U^{235} and radioactive debris was successfully located and cleaned up to a safe level

Operation Morning Light Clean Up



Additional Early NEST Exercises

- The Exercises held in 1980, at White Sands, NM were played as if on foreign soil
 - Since it was OCONUS, DOS was in charge not the FBI and DOS officials were present to oversee operations
 - NEST successfully performed its operations
- In 1984, Exercises were held in Albuquerque, NM and on the Kirtland Air Force Base
 - A major aspect was a low profile search for the notional IND in the city of Albuquerque which was successful
 - The Diagnostics, Device Assessment and Disablement were successfully performed on Kirtland AFB
 - For the first time SNL erected a foam filled containment tent which could contain debris from the detonation of up to 1000 lbs of HE

Other Early NEST Exercises

- In 1986 Exercises simulated an OCONUS device and a second device in Indianapolis, Indiana
 - It involved participants from DOE, DHS, FBI, CIA, FEMA and state and local officials from Indiana
 - NEST deployed teams to both sites, the OCONUS site being NTS
 - A notional detonation was assumed at Indianapolis and FEMA exercised Consequence Management
- Exercises were held on Camp Pendleton, CA in 1988
 - Involving a notional attack on a convoy where a US weapon was stolen and hostages taken
 - It involved NEST, FBI, ARG, RAP and CA Emergency Services
 - Interagency reactions went well and Search, Hostage Negotiations and Render Safe operations were performed

A Need for Reorganization

- Between 1975 and 1994 there were roughly 30 NEST Exercises and Deployments
- Exercises were held in New Orleans, October 16-21, 1994
 - Roughly 850 participants with about 300 from DOE!
 - We took over many rental cars, trucks and hotels
 - Footprint was **HUGE** – Operational Security (OPSec) was impossible
 - Joan Lunden was allowed to bring her “Behind Closed Doors” crew in to video tape the operation for a segment on NEST
- On the cover of Time Magazine was a picture with title “Nuclear Ninjas”

Restructuring of NEST

- **NEST became the Nuclear Emergency Support Team**
 - It was broken into 3 separate elements – NRAT, SRT&SAT and JTOT
- **NRAT – Nuclear Radiological Advisory Team**
 - CONUS – DEST and OCONUS – FEST
 - Washington team of advisors to local authorities
 - Search equipment and capabilities with focus on Maritime Search
 - Provide preliminary information for follow-on teams
- **SRT&SAT – Search Response & Augmentation Team**
 - SRT Highly trained, short-time response for search
 - SAT – SRT plus assistance from local police and fire personnel

JTOT – Joint Technical Operations Team

- JTOT consists of four phases
 - Phase I - Provide initial technical and scientific expertise in performing Initial Render Safe and Safe-to Move operations
 - Home Team support provided by LANL, LLNL, SNL, RSL & Pantex
 - Phase II – Provide technical expertise from NNSA nuclear weapons design and engineering labs to render IND Safe-to-Ship to a US site for disposition, disassembly or destruction
 - Phase III – Receive IND at NTS from Phase II for disassembly or destruction
 - Phase IV – Nuclear Forensics receives parts and materials from Phase III for analysis to determine characteristics
- Today JTOT is the term usually used for NEST since it is the major operational aspect of NEST

JTOT Research and Development

- Two extremely useful tools developed for Search and Diagnostics are the Detective and the Fission Meter
- In Device Assessment much work has been performed
 - A Device Assessors Handbook with hundreds of plots bases on thousands of calculations gives a quick assessment
 - Extensive unclassified literature and internet sites are continually searched to see what terrorists think can be done
 - The unclassified literature is reviewed for training and assessment
- Many Disablement tools have been developed & tested

Detective-Ex

- Licensed to ORTEC for Production and Marketing
- Being used for quick localization and explicit identification of Radioactive Materials by Airline and Customs Inspectors
- Many law-enforcement officers, bomb squads, HAZMAT Teams, and all RAP Teams have Detective-Ex units
- Thousands in use world wide including many foreign countries
- Features
 - Mechanically cooled no need for LN and other bulky components
 - Portable 22lb high purity germanium gamma-ray detector
 - Differentiates between potentially dangerous radioactive materials and otherwise harmless radioactive materials in real time

Detective-Ex



Fission Meter

- Licensed to ORTEC for Production and Marketing
- Has the highest efficiency per pound of any neutron detector
- Provides ability to differentiate cosmic ray neutron background from other neutron radioactive sources and fissile material neutron sources
- Rapid characterizing neutron radiation to distinguish benign neutron radiation from fissile radioactive material, which is critical for first responders
- Being used by NRAT and many foreign countries

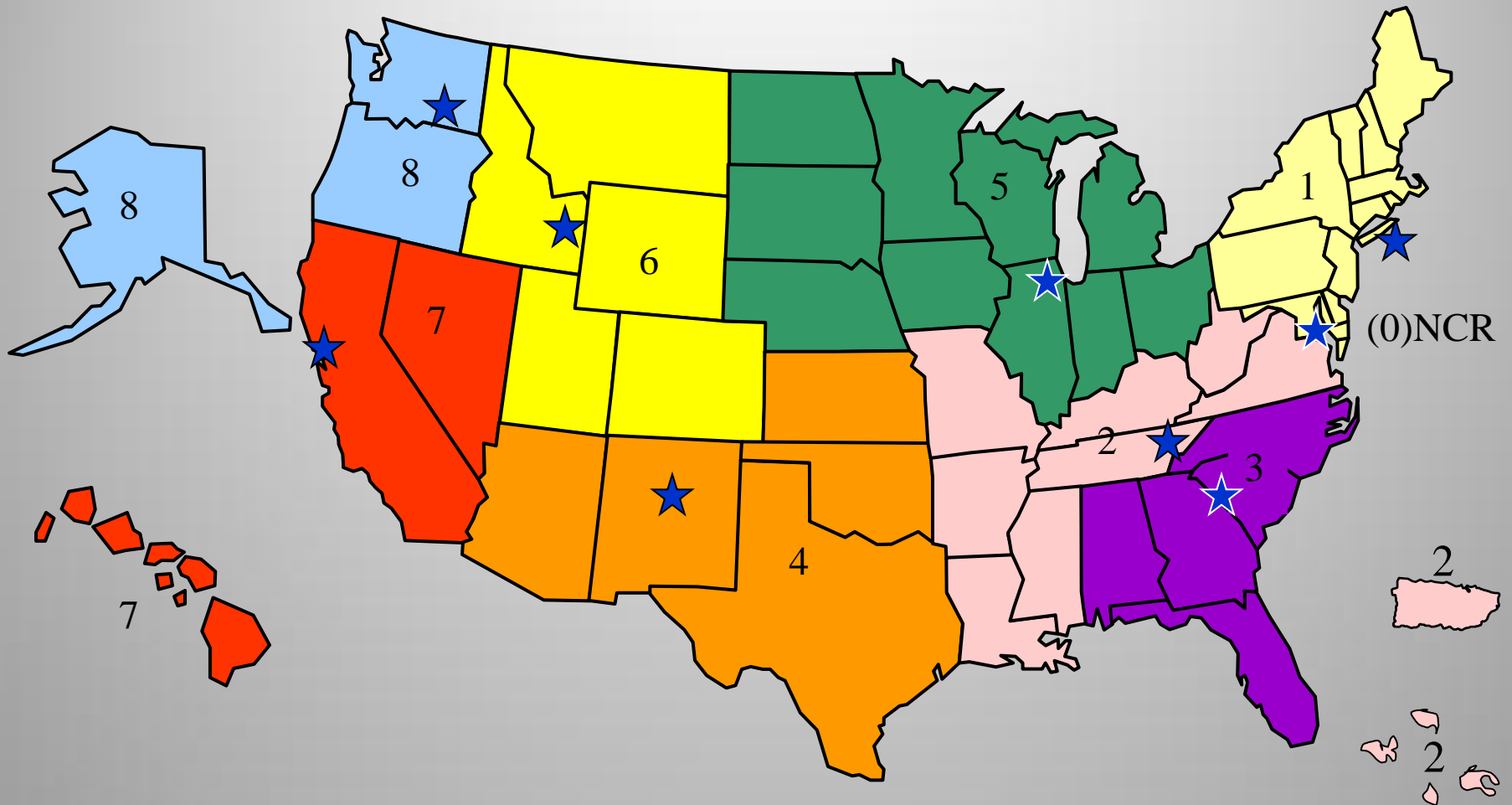
Fission Meter



RAP and Triage

- **First on the scene may be a Radiological Assistance Program (RAP) team**
 - There are 9 RAP regions through out the United States
- **Triage receives data from Police, Fire, Customs, RAP, etc who carry spectrometers and detect radioactivity**
 - LLNL, LANL, & SNL have staff on-call 24/7 to receive data
 - Independent experts from different labs analyze data
 - If they concur that the device is of interest, they contact HQ EOC which will deploy JTOT in response

Map of the 9 DOE RAP Regions



Nuclear Forensics

- Nuclear forensics is the technical means by which nuclear materials whether intercepted intact or retrieved from post-explosion debris, are characterized
- Nuclear forensics has been of considerable interest recently
 - 2007 APS/AAAS Panel on Nuclear Forensics report
 - “Nuclear Forensics Role, State of Art, and Program Needs”
 - 2010 National Academies Committee on Nuclear Forensics report
 - “Nuclear Forensics: A Capability at Risk”
- Considerable work is being performed on Nuclear Forensics at LLNL and LANL

JTOT Exercises and Readiness

- There are annual exercises which involve deployment of JTOT/EOD personnel to some location
- Deployments can be no notice where team members, who are on-call, must be to their home location rapidly, for deployment, without prior knowledge
- Annually there are exercises which involve government personnel in addition to JTOT
- With this extensive exercise program each deployable JTOT member, of both the Deployable Teams and Home Teams, is in a state of constant readiness to exercise their skills immediately as needed

Don't Mess with the NEST!

- **THEY ARE READY!**
- Questions?